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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/043,010	01/11/2002	Stanford R. Ovshinsky	2076	6131

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ENERGY CONVERSION DEVICES, INC.
2956 WATERVIEW DRIVE
ROCHESTER HILLS, MI 48309

EXAMINER

ZERVIGON, RUDY

ART UNIT PAPER NUMBER

1763

DATE MAILED: 03/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/043,010	Applicant(s) OVSHINSKY, STANFORD R.	
	Examiner Rudy Zervigon	Art Unit 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on has been entered.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “spent gas distribution system”, “spent gas collection/removal manifold system” must be shown or the feature canceled from the claims. No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet”

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pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 28-30, 36-38 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Applicant claims “spent gas evacuation system”, and “spent gas collection/removal manifold system”. The specification is devoid of such an element.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 28-30, 36-38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Claim 28-30, 36-38 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The

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omitted structural cooperative relationships are: “spent gas evacuation system”, “spent gas collection/removal manifold system” and the rest of the components.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 25, 31, 33, and 39 are rejected under 35 U.S.C. 102(b) as being anticipated by Turlot; Emmanuel et al. (US 6,502,530 B1). Turlot teaches a gas distribution cathode (31; Figure 2; column 6, lines 18-39) for plasma enhanced deposition of semiconductor materials onto multiple webs of substrate material simultaneously comprising: (a) a cathode body (31; Figure 2; column 6, lines 18-39): said cathode body (31; Figure 2; column 6, lines 18-39) comprising a monolithic body (31; Figure 2; column 6, lines 18-39) having two opposed planar exterior surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67) and an edge (top, bottom; Figure 2; column 6, lines 18-39); said monolithic body (31; Figure 2; column 6, lines 18-39) having a process gas distribution system (52,54,56,58,50; Figure 2; column 5, lines 27-67) integrated entirely therein, said process gas distribution system (52,54,56,58,50; Figure 2; column 5, lines 27-67) including: i) at least one primary gas distribution channel (52+horizontal portion between 52/54; Figure 2; column 5, lines 27-67) formed into said monolithic body (31; Figure 2; column 6, lines 18-39); said primary gas distribution channel (52+horizontal portion between 52/54; Figure 2; column 5, lines 27-67) beginning at a first point on the edge (top,

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bottom; Figure 2; column 6, lines 18-39) of said monolithic body (31; Figure 2; column 6, lines 18-39) and extending nearly completely through said monolithic body (31; Figure 2; column 6, lines 18-39) in a direction which is parallel to said planar surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67); a plurality of second gas distribution channels (56+horizontal portion between 56/58; Figure 2; column 5, lines 27-67) branching off from said primary gas distribution channel (52+horizontal portion between 52/54; Figure 2; column 5, lines 27-67) and extending nearly completely to the edge (top, bottom; Figure 2; column 6, lines 18-39) of said monolithic body (31; Figure 2; column 6, lines 18-39) in a direction which is parallel to said planar surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67); and iii) a plurality of gas outlet channels (58; Figure 2; column 5, lines 27-67) branching off from said secondary gas distribution channels (56+horizontal portion between 56/58; Figure 2; column 5, lines 27-67) and extending to gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) at one of said opposed planar exterior surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67) of monolithic body (31; Figure 2; column 6, lines 18-39), some of said plurality of gas outlet channels (58; Figure 2; column 5, lines 27-67) extending to gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) at a first of said two opposed planar exterior surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67) and the remainder of said plurality of gas outlet channels (58; Figure 2; column 5, lines 27-67) extending to gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) at a second of said two opposed planar exterior surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67) such that the gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) are evenly dispersed on both of said planar surfaces (horizontal portions

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of 50,54,56,58; Figure 2; column 5, lines 27-67) of said monolithic body (31; Figure 2; column 6, lines 18-39); and (b) a plurality of gas dispersion plates (horizontal portions above 50; Figure 2) covering said gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) so as to prevent direct, line-of-sight travel of process gas from said gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) to a substrate upon which semiconductor material is to be deposited, as claimed by claim 25

Turlot further teaches:

- i. The gas distribution cathode (31; Figure 2; column 6, lines 18-39) of claim 25, wherein said monolithic body (31; Figure 2; column 6, lines 18-39), and said gas dispersion plates (horizontal portions above 50; Figure 2) are formed from a metal or metallic alloy which is noncreative with said process gases, as claimed by claim 31 – Applicant’s claim requirement of “is noncreative with said process gases” is a claim requirement of intended use in the pending apparatus claims. Said use depends on the gas identity – Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

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- ii. An apparatus for the plasma enhanced deposition of semiconductor materials onto one or more webs of substrate material, said apparatus including: a gas distribution cathode (31; Figure 2; column 6, lines 18-39) comprising: (a) a cathode body (31; Figure 2; column 6, lines 18-39); said cathode body (31; Figure 2; column 6, lines 18-39) comprising a monolithic body (31; Figure 2; column 6, lines 18-39) having two opposed planar exterior surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67) and an edge (top, bottom; Figure 2; column 6, lines 18-39); said monolithic body (31; Figure 2; column 6, lines 18-39) having a process gas distribution system (52,54,56,58,50; Figure 2; column 5, lines 27-67) integrated entirely therein. said process gas distribution system (52,54,56,58,50; Figure 2; column 5, lines 27-67) including; at least one primary gas distribution channel (52+horizontal portion between 52/54; Figure 2; column 5, lines 27-67) formed into said monolithic body (31; Figure 2; column 6, lines 18-39); said primal gas distribution channel beginning at a first point on the edge (top, bottom; Figure 2; column 6, lines 18-39) of said monolithic body (31; Figure 2; column 6, lines 18-39) and extending nearly completely through said monolithic body (31; Figure 2; column 6, lines 18-39) in a direction which is parallel to said planar surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67); ii) a plurality of secondary gas distribution channels (56+horizontal portion between 56/58; Figure 2; column 5, lines 27-67) branching off from said primary gas distribution channel (52+horizontal portion between 52/54; Figure 2; column 5, lines 27-67) and extending nearly completely to the edge (top, bottom; Figure 2; column 6, lines 18-39) of said monolithic body (31; Figure 2; column 6, lines 18-39) in a direction which is parallel to

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said planar surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67); and iii) a plurality of gas outlet channels (58; Figure 2; column 5, lines 27-67) branching off from said secondary gas distribution channels (56+horizontal portion between 56/58; Figure 2; column 5, lines 27-67) and extending to gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) at one of said two opposed planar exterior surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67) of monolithic body (31; Figure 2; column 6, lines 18-39), some of said plurality of gas outlet channels (58; Figure 2; column 5, lines 27-67) extending to gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) at a first of said two opposed planar exterior surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67) and the remainder of said plurality of gas outlet channels (58; Figure 2; column 5, lines 27-67) extending to gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) at a second of said two opposed planar exterior surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67) such that the gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) are evenly dispersed on both of said planar surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67) of said monolithic body (31; Figure 2; column 6, lines 18-39); and (b) a plurality of gas dispersion plates (horizontal portions above 50; Figure 2) covering said gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) so as to prevent direct, line-of-sight travel of process gas from said gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) to a substrate upon which semiconductor material is to be deposited, as claimed by claim 33

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- iii. The apparatus of claim 33, wherein said monolithic body (31; Figure 2; column 6, lines 18-39) and said gas dispersion plates (horizontal portions above 50; Figure 2) of said gas distribution cathode (31; Figure 2; column 6, lines 18-39) are formed from a metal or metallic alloy which is nonreactive with said process gases, as claimed by claim 39 – Applicant’s claim requirement of “is noncreative with said process gases” is a claim requirement of intended use in the pending apparatus claims. Said use depends on the gas identity – Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 26-30, and 34-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Turlot; Emmanuel et al. (US 6,502,530 B1) in view of Drage; David J. (US 4,590,042 A). Turlot is discussed above. Turlot does not teach:

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- i. The gas distribution cathode (31; Figure 2; column 6, lines 18-39) of claim 25, wherein said gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) are evenly positioned on said two opposed planar surfaces (horizontal portions of 54,56,58; Figure 2; column 5, lines 27-67) of said monolithic body (31; Figure 2; column 6, lines 18-39) said from 1 to 4 inches apart, as claimed by claim 26
- ii. The gas distribution cathode (31; Figure 2; column 6, lines 18-39) of claim 26, wherein said gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) are evenly positioned on said two opposed planar surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67) of said monolithic body (31; Figure 2; column 6, lines 18-39) from 2 to 3 inches apart, as claimed by claim 27
- iii. The gas distribution cathode (31; Figure 2; column 6, lines 18-39) of claim 25, further including a spent gas evacuation system, as claimed by claim 28
- iv. The gas distribution cathode (31; Figure 2; column 6, lines 18-39) of claim 28, wherein said spent gas evacuation system includes spent gas inlets evenly positioned exclusively along said edge (top, bottom; Figure 2; column 6, lines 18-39) of said of said monolithic body (31; Figure 2; column 6, lines 18-39), as claimed by claim 29
- v. The gas distribution cathode (31; Figure 2; column 6, lines 18-39) of claim 29, wherein said spent gas inlets are connected to a spent gas collection/removal manifold system formed within said monolithic body (31; Figure 2; column 6, lines 18-39), as claimed by claim 30
- vi. The apparatus of claim 33, wherein said gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) of said gas distribution cathode (31; Figure 2; column 6, lines

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- 18-39) are evenly positioned on said two opposed planar surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67) of said monolithic body (31; Figure 2; column 6, lines 18-39) said from 1 to 4 inches apart, as claimed by claim 34
- vii. The apparatus of claim 34, wherein said gas outlets (vertical portions of 54,56,58; Figure 2; column 5, lines 27-67) of said gas distribution cathode (31; Figure 2; column 6, lines 18-39) are evenly positioned on said two opposed planar surfaces (horizontal portions of 50,54,56,58; Figure 2; column 5, lines 27-67) of said monolithic body (31; Figure 2; column 6, lines 18-39) from 2 to 3 inches apart, as claimed by claim 35
- viii. The apparatus of claim 33, wherein said gas distribution cathode (31; Figure 2; column 6, lines 18-39) further includes a spent gas evacuation system, as claimed by claim 36
- ix. The apparatus of claim 36, wherein said spent gas evacuation system includes spent gas inlets evenly positioned exclusively along said edge (top, bottom; Figure 2; column 6, lines 18-39) of said of said monolithic body (31; Figure 2; column 6, lines 18-39) , as claimed by claim 37
- x. The apparatus of claim 37, wherein said spent gas inlets are connected to a spent gas collection/removal manifold system formed within said monolithic body (31; Figure 2; column 6, lines 18-39) , as claimed by claim 38

Drange teaches a gas distribution cathode (13; Figure 1; column 2; lines 26-68; column 4; lines 17-25) further including a spent gas evacuation system (37, 42, 41, and 31; Figure 4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Drange's spent gas evacuation system to Turlot's apparatus including optimizing the relative locations of Turlot's gas outlets.

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Motivation to add Drange's spent gas evacuation system to Turlot's apparatus including optimizing the relative locations of Turlot's gas outlets is to promote even depositions and thereby avoid unwanted patterning as taught by Drange (column 1, lines 28-35). Further, it is well established that the rearrangement of parts is considered obvious to those of ordinary skill (In re Japikse , 181 F.2d 1019, 86 USPQ 70 (CCPA 1950); In re Kuhle , 526 F.2d 553, 188 USPQ 7 (CCPA 1975); Ex parte Chicago Rawhide Manufacturing Co. , 223 USPQ 351, 353 (Bd. Pat. App. & Inter. 1984).; MPEP 2144.04)

12. Claims 32 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Turlot; Emmanuel et al. (US 6,502,530 B1) and Drage; David J. (US 4,590,042 A) in view of Dhindsa; Rajinder et al (US 6,786,175 B2). Turlot and Drange are discussed above. Turlot and Drange do not teach:

- i. The gas distribution cathode (31; Figure 2; column 6, lines 18-39) of claim 31, wherein said metal or metallic alloy which is nonreactive with said process gases is stainless steel, as claimed by claim 32

Dhindsa teaches a stainless steel cathode showerhead (310; Figure 3) for plasma operations (column 8; lines 14-33) including process gas distribution holes (354; Figure 3) with optimal spacing as taught by Dhindsa.

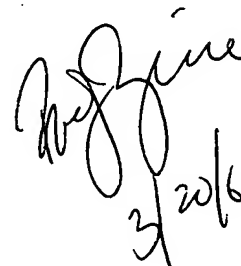
It would have been obvious to one of ordinary skill in the art at the time the invention was made for Drage to use stainless steel material for his Drage's dispersion plates (15; Figure 1; column 2; lines 26-68) as taught by Dhindsa.

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Motivation for Drage to use stainless steel material for his Drage's dispersion plates (15; Figure 1; column 2; lines 26-68) as taught by Dhindsa is to enhance transfer heat through Drange's dispersion plates as taught by Dhindsa (column 8; lines 14-33).

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272-1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official fax phone number for the 1763 art unit is (571) 273-8300. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272-1435.

Handwritten signature of Rudy Zervigon and date 3/20/6.